

1 **(BSP December 14, 2000)**

2 **Polymer Concrete**

3 **Mix Design**

4 Polymer concrete shall be composed of the following three components -
5 epoxy resin base, epoxy resin base hardener, and aggregate, in
6 accordance with Section 6-02.2 as supplemented in these Special
7 Provisions.

8
9 The Contractor shall prepare and submit the polymer concrete design mix
10 and mixing procedure, including samples of all components for each lot, to
11 the WSDOT Materials Laboratory for testing. The Contractor shall not
12 begin ordering materials for application of the polymer concrete until
13 receiving the Engineer's approval of the polymer concrete design mix and
14 mixing procedure.

15
16 **Delivery and Storage of Materials**

17 All materials shall be delivered in their original containers bearing the
18 manufacturer's label, specifying date of manufacturing, batch number, trade
19 name brand, quantity, and mixing ratio.

20
21 The material shall be stored to prevent damage by the elements and to
22 ensure the preservation of their quality and fitness for the work. The
23 storage space shall be kept clean and dry, and shall contain a high-low
24 thermometer. The temperatures of the storage space shall not fall below
25 nor rise above that recommended by the manufacturer. Every precaution
26 shall be taken to avoid contact with flame.

27
28 Stored materials shall be inspected prior to their use, and shall meet the
29 requirements of these Special Provisions at the time of use.

30
31 Any material which is rejected because of failure to meet the required tests
32 or that has been damaged so as to cause rejections shall be immediately
33 replaced at no additional expense to the Contracting Agency.

34
35 Sufficient material to perform the entire polymer concrete application shall
36 be in storage at the site prior to any field preparation, so that there shall be
37 no delay in procuring the materials for each day's application.

38
39 **Material Health and Safety Training and Precautions**

40 The Contractor shall arrange to have the material supplier furnish technical
41 service relating to application of material and health and safety training for
42 personnel who are to handle the polymer concrete.

43
44 Appropriate impermeable protective garments shall be used by all workers
45 who may contact the resin or initiators to prevent skin contact. If skin
46 contact occurs, the resin or initiators shall be immediately washed off.
47 Clothing that becomes saturated with resin shall be removed immediately.

48
49 **Equipment and Containment**

50 All equipment for cleaning the concrete and steel surfaces, and mixing and
51 applying the polymer concrete, shall be submitted to the Engineer for
52 approval.

1
2 The epoxy resin, and abrasive blasting materials, shall be contained and
3 restricted to the surface receiving the polymer concrete only, and shall not
4 escape to the surrounding environment. The Contractor shall submit the
5 method and materials used to collect and contain the epoxy resin, and
6 abrasive blasting materials, to the Engineer for approval.
7

8 The Contractor shall not begin polymer concrete work, including surface
9 preparation, until receiving the Engineer's approval of the equipment, and
10 the collection and containment system.
11

12 **Surface Preparation**

13 Using the equipment, material, technique, and procedures established for
14 surface preparation, the concrete and steel surfaces shall be prepared by
15 removing all material which may act as a bond breaker between the surface
16 and the polymer concrete. Surface cleaning shall be by abrasive blasting.
17

18 Precautions shall be taken to ensure that no dust or debris leaves the
19 roadway deck and that all traffic is protected from rebound and dust.
20 Appropriate shielding shall be provided as required at no additional expense
21 to the Contracting Agency and shall be as approved by the Engineer.
22

23 If the concrete or steel surfaces become contaminated, the contaminated
24 areas shall be recleaned by abrasive blasting at no additional expense to
25 the Contracting Agency.
26

27 **Application of Prime Coat**

28 The area to receive the prime coat shall be surface dry prior to applying the
29 prime coat. Immediately prior to applying the prime coat, the surfaces shall
30 be swept clean by compressed air to remove accumulated dust and any
31 other loose material.
32

33 The Contractor shall apply one coat of epoxy resin binder (prime coat) to
34 the prepared concrete and steel surfaces immediately before placing the
35 polymer concrete. The promoted/initiated resin shall be worked into the
36 concrete in a manner to assure complete coverage of the area.
37

38 If the primed surface becomes contaminated, the contaminated area shall
39 be cleaned by abrasive blasting and reprimed at no additional expense to
40 the Contracting Agency.
41

42 Under no circumstances shall any resin run into drains or expansion joints,
43 or otherwise escape the Contractor's collection and containment system.
44

45 **Mixing Components**

46 The epoxy resin binder in the polymer concrete shall be approximately 12
47 percent by weight of the dry aggregate. The exact percentage will be
48 determined by the Engineer.
49

50 Accelerators or inhibitors may be required as recommended by the epoxy
51 resin supplier.
52

1 The epoxy resin binder shall be initiated and thoroughly blended just prior to
2 mixing the aggregate and binder.

3
4 **Polymer Concrete Placement**

5 The polymer concrete shall be placed on the liquid prime coat.

6
7 Under no circumstances shall any polymer mixture run into drains or
8 expansion joints, or otherwise escape the Contractor's collection and
9 containment system.

10
11 **Finished Polymer Concrete Surface**

12 The finished surface of the polymer concrete shall conform to the
13 requirements of Section 6-02.3(10).

14
15 The polymer concrete shall be consolidated by means approved by the
16 Engineer. Finishing equipment used shall strike off the polymer concrete to
17 the established grade and cross section. Forms shall be coated with
18 suitable bond release agent to permit ready release of forms.

19
20 The polymer concrete shall receive an abrasive sand finish as needed.

21
22 The sand finish shall be applied by hand immediately after strike-off. Sand
23 shall be broadcast onto the surface before gelling occurs to effect a uniform
24 coverage of a minimum of 0.8 pounds per square yard.

25
26 The surface texture of polymer concrete surface shall be uniform. The
27 polymer concrete shall be impervious to moisture.

28
29 **Curing**

30 Traffic and equipment shall not be permitted on the polymer concrete until it
31 has achieved a minimum compressive strength of 1,500 psi as determined
32 by the rebound number per ASTM C 805.